

Brewers' Wastewater Bulletin



SEPTIC & SANITARY SEWER

THIS ISSUE

- Septic Systems
- Sanitary Sewer
- Combined Process and Sewage

RELATED ISSUES

- Wastewater Composition
- Chemicals, Cleaners, Etc.
- Stormwater
- Wastewater Management and Improvements

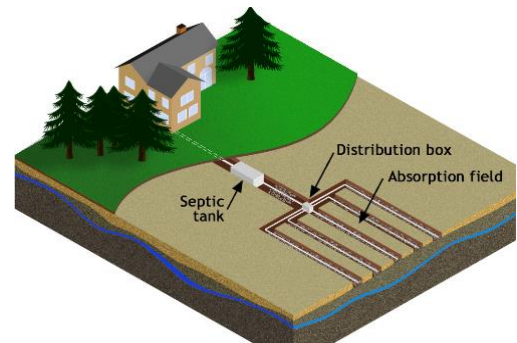
Every brewery or distillery generates wastewater and these processes will create different amounts of wastewater per barrel of product. Several factors dictate how that wastewater is removed from the facility. There are two primary discharge methods: *septic systems* and *sanitary sewer*.

Septic systems are on-site treatment systems that separate solids from water and use a leach bed to discharge the water. The solids left behind are concentrated and partially broken down by micro-organisms. Eventually the solids are pumped out and hauled to a wastewater treatment facility for further treatment.

Sanitary sewer is an underground piping system that connects residential, commercial, and industrial facilities to a municipal wastewater treatment plant.

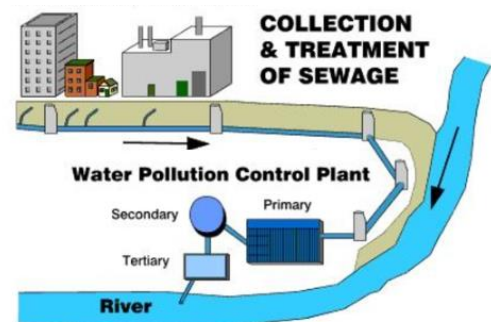
A third and less common method is to containerize wastewater and have it shipped out for treatment. This method is usually cost prohibitive and requires more land or floor space as well as intense oversight.

Regardless of which method is used to discharge your wastewater, careful considerations are required to reduce maintenance and failure risk, and to drive down overall water management operating costs.



Most facilities will not have a choice between sanitary or septic discharges. The best opportunity to choose between the two discharge methods is during new construction and relocation. Some businesses may have the resources to change their discharge method, but that is very uncommon due to cost.

If you have the ability to choose between septic discharge and sanitary sewer then you must understand how the systems operate, what maintenance is required for optimal performance and what your downstream affect will be in the waste cycle. The following information has been collected to help you understand your system and the difference between the two primary discharge systems, *septic* and *sanitary*.



SEPTIC SYSTEMS

Your facility location, or prospective location, may not have a sanitary sewer nearby – this is often the situation in rural or low-density suburban areas. As a result, you may need to rely on an in-ground septic system as your wastewater disposal option. The design & construction of private septic systems is dependent on site-specific soil type(s), the depth and area of those soils, ground contour, and the proximity of neighboring properties or sensitive environmental features like wells, ponds, lakes, and streams.

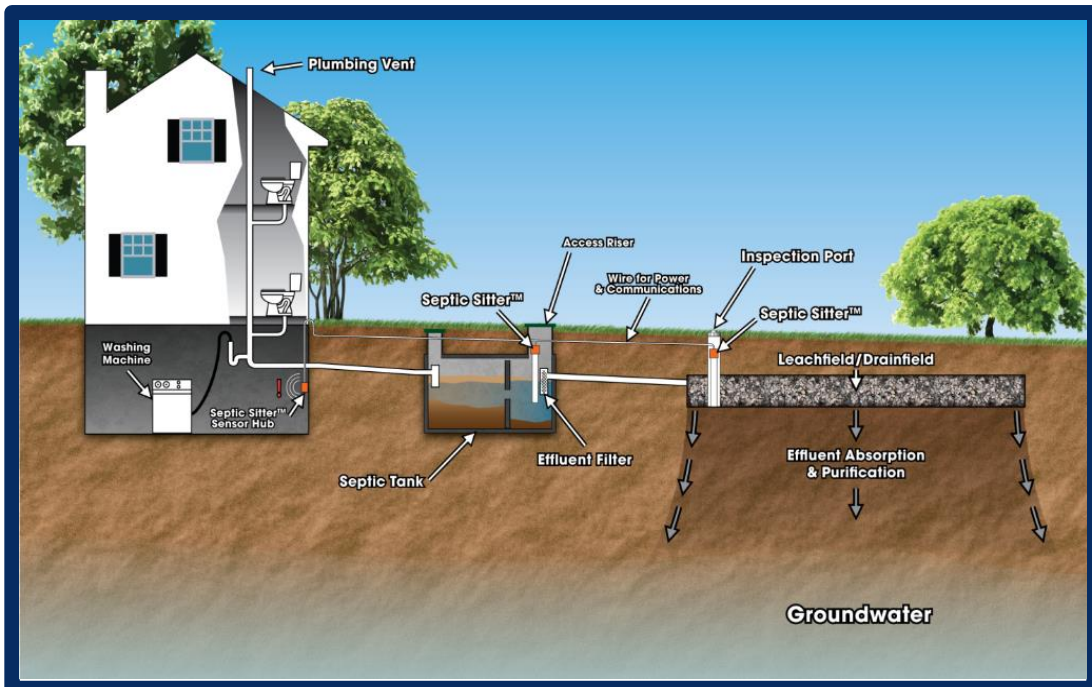
Septic system design and construction is covered under local plumbing codes (State code incorporated therein), so check in with your Code Enforcement Officer/Local Plumbing Inspector regarding system design requirements. To install a new system or evaluate an existing one, you will need the services of a licensed site evaluator, or a local engineering firm that specializes in this type of work.

Many distilleries or small brewing operations start out in the family homestead or a convenient garage, barn or small utility structure. If there is an existing septic system keep in mind that it was historically designed for the then-current use. Hopefully it is still functioning effectively and compliantly in that capacity. The older it is, the harder it's been used, and the poorer its maintenance history, the riskier it will be to your business. If you are successful and your business grows, what was originally adequate may no longer work for you.

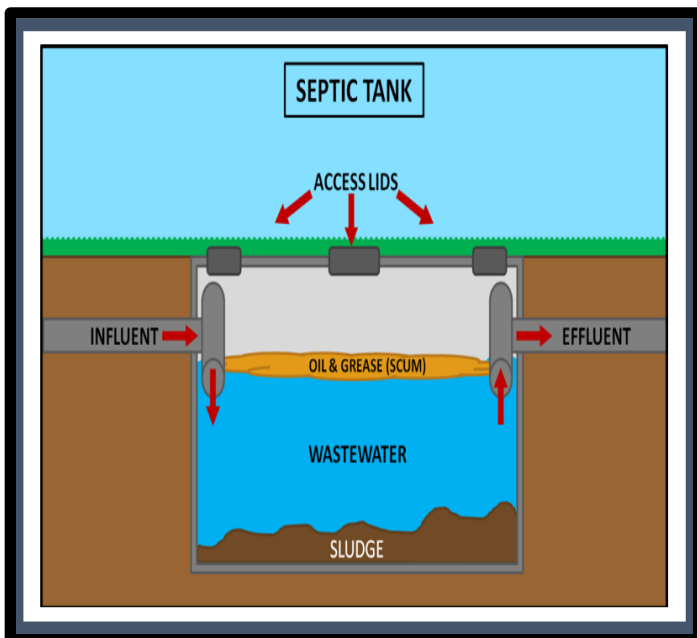
SEPTIC SYSTEM DESIGN

Though the details of any given system may vary, in general:

- All wastewaters to be treated are captured through floor, sink, and other devices, typically into a single pipe line. If you elect to have your entire household waste stream captured, then you must take the combined sanitary & process waste stream hydraulic, organic, and solids loadings into account. If there is sufficient space available, an option could be to have two separate systems, one collecting & disposing of the residential sanitary waste stream, and the other dealing with the commercial/process waste streams you'll be generating. If you elect to provide food service as part of your business, you will want to provide appropriate grease capture capacity in your plumbing or system design.



- In the simplest case, wastewater in a septic system flows by gravity into one or more septic tanks. If the tanks are located up-hill or at a significant distance from your facility, install a small pump station to move your wastewater to the tank(s). Heavier solids settle out here, and the tank(s) need to be pumped out by a septage hauler frequently enough to prevent carry-over of solids in the supernatant. If you wait too long to pump out your tank(s), you risk ruining your infiltration system and setting yourself up for a substantial repair/replacement bill. Solids buildup is directly related to intensity of use; it's up to you to figure out the right schedule and to inform septage haulers that your waste solids contain brewery wastes. You may be asked to provide analytical information, most likely the Biological Oxygen Demand (BOD), % solids, and pH of your waste.



- Septic tank supernatant will flow by gravity into a distribution box located at the head of your leach field(s), and from there down through the imbedded infiltrators and into the ground. These kinds of “passive” treatment systems rely on a natural bacterial buildup in the leach fields to consume organic contaminants. When properly sized and functioning they provide for a very clean recharge into the shallow ground water table. Infiltration systems are sized based on the information you provide, so take future business plans (flows, loading, food service, etc.) into account when completing initial design or assessment. It's far easier and cheaper to be initially oversized than to have to break ground a number of years from now to expand or replace your system.
- Engineered mechanical systems of various types that rely on different treatment processes to remove the same contaminants are available. Such systems typically entail a somewhat higher burden of ongoing care & maintenance, but are useful in cases where the facility site is restricted in some manner. The discharge of these treatment systems is then disposed of through similar infiltration systems.
- Brewery and distillery wastewater is typically “rich” in BOD and solids, and can exhibit high and low pH swings and toxic biological impacts from cleaning and sanitizing chemicals. It is very beneficial to have an appropriately sized tank or sump available in your facility to provide for flow and pH equalization of the waste streams you generate. Plan on being able to adjust the pH of this waste stream prior to discharge to keep it in the 6 – 10 range. Excessive acidity or alkalinity is detrimental to both biological and mechanical treatment systems.

Depending on how efficient you are at water conservation, equalizing flow, capturing & side-streaming solids (grain, hops, trub, adjuncts, filter media, tramp grit), and balancing pH you may be able to tax your existing system with an extra 20, 30, even 50 gallons a day if you're maintaining it well. Regardless, do your wastewater disposal planning up front as part of your business plan – don't wait until it becomes a problem to address it. Makes \$en\$e, right?

SANITARY SEWER SYSTEMS

If your brewery or distillery is within an area that has sanitary sewer service, there are some aspects that need to be addressed to minimize pollutants discharged to the sewer. Many of the same concerns identified in the previous section come into play when utilizing a sewer system. They include pH swings, organic loading, and solids. Additional items to consider before starting your brewery include discharge limits, whether or not a permit or discharge license is needed, and ability to monitor and sample process discharge if necessary.

CONSIDERATIONS

1. Each sanitary sewer system connects to a treatment facility and each facility, including the collection system that feeds it, has a capacity for both volume, flow rate, and organic loadings. It is important to know where and how your discharge gets to the facility and how it is treated. Brewers and distillers that discharge to the sewer system need to meet the treatment facility's discharge limits and avoid prohibited discharges. It is extremely important to find out what needs to be done to discharge to the sewer so you can build out your brewery correctly the first time. Contact your local treatment facility to determine what requirements may apply.
2. Apply for a license or permit if needed. Each facility and local sanitary district may have different requirements for pretreatment and may require a discharge license or permit to connect and discharge to the facility. You may also need to install a monitoring point in your process to sample the discharge. Again, it is better to cover your bases with the ability to treat discharge when building out.
3. Many of the pollutants within brewing and distilling wastewater were covered in the previous section but the following are pollutants of concern in sanitary sewer systems. They are listed in order of importance:
 - a. pH - While each facility has specific limits, the pH of brewery and distillery wastewater will generally need to be within a range of 5 – 12 standard units. A low pH is too acidic while a high pH is too alkaline. Both of these can seriously corrode the sewer system and affect the wastewater treatment facility's ability to treat the wastewater. A neutralization tank, particularly for cleaning and sanitizing discharges, can limit pH swings.
 - b. Biochemical Oxygen Demand – BOD is the food of wastewater treatment microorganisms but can cause issues at the facility if there is not enough organic capacity to handle it. If there is too much BOD and too few critters to eat it, the system will not operate efficiently and treatment will suffer.
 - c. Total Suspended Solids - Solids such as spent yeast, grains, hops and trub that settle are capable of causing blockages in the collection system or in pumps throughout the system. A company or facility that discharges solids which cause a sewage backup is liable for any damages. Proper screening and byproduct disposal can go a long way in preventing issues.
 - d. Temperature – High temperatures can impact the collection system and the facility. Many newer sewer services are made of PVC, which can begin losing integrity at temperatures of 140 degrees Fahrenheit.



Suspended Solids – Build Up



Suspended Solids



Blocked Check Valve from Brewery Operations Solids

Sanitary sewer system design and construction is covered under local plumbing codes (State code incorporated therein), so check in with your Code Enforcement Officer/Local Plumbing Inspector regarding system design requirements. To install a new connection to the sewer (or evaluate an existing one), you will need the services of a licensed site evaluator, or a local engineering firm that specializes in this type of work. The existing system may already move bathroom and kitchen wastewater to the sewer, but consider a separate sewer pipe for brewery process waste. Once outside the building the sanitary and process pipes can combine before they reach the sewer, or they can enter the sewer at separate points. Installing a separate process line is beneficial if you have to provide pretreatment before sending your brewery wastewater to the sewer. You may not have a treatment requirement currently, but this may change in the future.

If your business is moving into a new facility, work with the local sanitary district, treatment facility, or municipality to determine whether the collection system can handle your expected discharge and will impact pump stations in the system. Discuss sewer fees and connection fees as these rates vary in each community. It is highly recommended to investigate sewer fee rates and connection fees prior to investing into a facility, new or old, that discharges to sanitary sewer. The sewer district, treatment facility, or municipality may not have the flexibility to adjust sewer or connection fees to meet your operational budget demands, or they may not have the treatment capacity to handle your wastewater characteristics without significant investments. For these reasons it is critical to contact the entity tasked with managing the sanitary sewer system PRIOR to committing to a facility or operation.

One final point to remember when thinking about sanitary and septic wastewater systems: They are connected! Your sanitary system conveys water from your facility to the wastewater treatment plant which then discharges treated wastewater to one of Maine's rivers or to the Atlantic Ocean. Your septic system discharges water to subsurface soils which will eventually reach a waterbody. Septic tank solids pumped and hauled by a licensed waste hauler are taken to a local wastewater treatment facility for further processing. Due to the high BOD levels in your septic tank, restrictions may be placed on the hauler by the wastewater treatment facility which could be passed on to you.

USEFUL INFORMATION

Maine Water Environment Association (MeWEA)

www.mewea.org

The mission of the Maine Water Environment Association is to support and enhance Maine's water environment community.

To achieve this we will:

- Promote training opportunities for the water environment community;
- Support balanced environmental policy and practice;
- Promote education and collaboration with the public to protect and enhance Maine's water resources;
- Foster a strong and resilient water environment community

MeWEA Pretreatment Committee – Brewery Resources

<https://www.mewea.org/pretreatment-committee/>

Brewers Association Wastewater Management Guidance Manual

<https://www.brewersassociation.org/educational-publications/wastewater-management-guidance-manual/>

Maine Department of Environmental Protection – Stormwater Management Best Practices For Breweries

<https://www.maine.gov/dep/water/wd/multisector/breweryBMP2017.pdf>

MeWEA Committees

[Awards Committee](#)

[Collection Systems](#)

[Communications](#)

[Conventions](#)

[Government Affairs](#)

[Laboratory](#)

[New Media](#)

[Treatment Plant Operators](#)

[Personnel Advancement](#)

[Pretreatment](#)

[Public Relations](#)

[Safety](#)

[Stormwater](#)

[Young Professionals](#)

Committee information can be found on the MeWEA website, www.mewea.org

Maine Water Environment Association



60 Community Drive
Augusta, ME 04330
1-800-452-8786

WWW.MEWEA.ORG

PROTECTING MAINE'S WATER
RESOURCES